

PATENT ABSTRACTS OF JAPAN

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(21)Application number : 07-002774

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(54) PRODUCTION OF AQUEOUS RESIN DISPERSION

(57)Abstract:

PURPOSE: To obtain an aqueous resin dispersion which does not change in adhesion after storage and having a film Tg in a specified range by emulsion- polymerizing a (meth)acrylic-acid-containing radical polymerizable monomer in the presence of an epoxy resin in an aqueous medium having a pH in a specified range.

CONSTITUTION: A (meth)acrylic-acid-containing radical-polymerizable monomer is polymerized in an amount of 40-80 pts.wt. in the presence of 20-60 pts.wt. epoxy resin in an aqueous medium. In this emulsion polymerization, the pH of the aqueous medium is adjusted to 5-8 to obtain an aqueous resin dispersion which can give a film of a Tg of 10-40°C. As the pH during the emulsion polymerization is adjusted to 5-8, this dispersion does not undergo any change during storage, does not undergo any change in adhesion after storage, has good compatibility as compared with a conventional emulsion being a combination with an epoxy resin, has therefore good contact, can be smoothly cured with an epoxy resin and has therefore performance equivalent to that of a solvent-based chloroprene adhesive.

LEGAL STATUS

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 TI Manufacture of water-thinned acrylic polymer dispersions with stable
 adhesion strength
 IN Ootsuka, Masahiko; Yoshitomi, Nobuko
 PA Asahi Chemical Ind., Japan; Asahi Kasei Chemical Corp.
 SO Jpn. Kokai Tokkyo Koho, 9 pp.
 CODEN: JKXXAF
 DT Patent
 LA Japanese
 IC ICM C08F002-44
 ICS C08F002-22; C08F290-06; C08G059-17; C08G059-40; C09D163-10
 CC 35-4 (Chemistry of Synthetic High Polymers)
 Section cross-reference(s): 38

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PRAI	JP 1995-2774		19950111		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
JP 08188605	ICM	C08F002-44
	ICS	C08F002-22; C08F290-06; C08G059-17; C08G059-40; C09D163-10
	IPCI	C08F0002-44 [ICM,6]; C08F0002-22 [ICS,6]; C08F0290-06 [ICS,6]; C08G0059-17 [ICS,6]; C08G0059-40 [ICS,6]; C09D0163-10 [ICS,6]

AB Title dispersions, giving films with Tg +10 to -40°, are manufactured by
emulsion polymerization of 40-80 parts radically polymerizable monomers
 containing
(meth)acrylic acid in H2O at pH 5-8 in the presence of 20-60 parts epoxy
resins. Thus, Araldite AER 260 20, styrene 24, Bu acrylate 53, and
methacrylic acid 3 parts were emulsion polymerized to give an emulsion with
viscosity 4000 cP and Tg -18°, 100 parts of which was mixed with 4
 parts Ancamine 2075 to give an adhesive showing good heat and water
 resistance.

ST acrylic polymer dispersion emulsion polymn adhesive; heat resistance
 adhesive acrylic epoxy polymer; water resistance adhesive acrylic epoxy
 polymer

IT Adhesives

Heat-resistant materials
 Water-resistant materials

(manufacture of water-thinned acrylic polymer dispersions with stable
 adhesion strength by emulsion polymerization)

IT Epoxy resins, preparation

RL: IMF (Industrial manufacture); TEM (Technical or engineered material
 use); PREP (Preparation); USES (Uses)

(acrylic, manufacture of water-thinned acrylic polymer dispersions with
 stable adhesion strength by emulsion polymerization)

IT Polymerization

(emulsion, manufacture of water-thinned acrylic polymer dispersions with
 stable adhesion strength by emulsion polymerization)

IT Acrylic polymers, preparation

RL: IMF (Industrial manufacture); TEM (Technical or engineered material
 use); PREP (Preparation); USES (Uses)

(epoxy, manufacture of water-thinned acrylic polymer dispersions with stable
 adhesion strength by emulsion polymerization)

IT 88375-39-7, Ancamine 1769 181719-60-8, Ancamine 2075

RL: MOA (Modifier or additive use); TEM (Technical or engineered material
 use); USES (Uses)

(curing agents; manufacture of water-thinned acrylic polymer dispersions

DERWENT-ACC-NO: 1996-388606

DERWENT-WEEK: 200434

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TITLE: Aq. resin emulsion prepn.- by emulsion polymerisation
of epoxy resin and radical polymeric monomers contg.
acrylic acid and/or methacrylic acid, in watercontg.
medium

PATENT-ASSIGNEE: ASAHI KASEI KOGYO KK[ASAH]

PRIORITY-DATA: 1995JP-0002774 (January 11, 1995)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAINIPC
JP 3529181 B2	May 24, 2004	N/A	008	C08F 002/44
<u>JP 08188605 A</u>	July 23, 1996	N/A	009	C08F 002/44

APPLICATION-DATA:

PUB-NO	APPL-DESCRIPTOR	APPL-NO	APPL-DATE
JP 3529181B2	N/A	1995JP0002774	January 11, 1995
JP 3529181B2	Previous Publ.	JP 8188605	N/A
JP 08188605A	N/A	1995JP0002774	January 11, 1995

INT-CL (IPC): C08F002/22, C08F002/44 , C08F290/06 , C08G059/17 ,
C08G059/40 , C09D163/10

ABSTRACTED-PUB-NO: JP 08188605A

BASIC-ABSTRACT:

The prepn. of aq. resin emulsion, comprises emulsion polymerisation of: (A) 20-60 (pts. wt.) of epoxy resin and (B) 4080 pts. wt. of radical polymeric monomers contg. acrylic acid and/or methacrylic acid in watercontg. medium of pH 5-8. The Tg of the film prepd. from the emulsion is from 10 to 40deg.C.

The epoxy resin is a glycidyl ether (e.g. bisphenol A), glycidyl ester (e.g. hexahydrophthalic acid), or glycidyl amine (e.g. tetraglycidylamino-diphenylmethane). The monomers are a mixt. of styrene, ethylacrylate, butylacrylate and 2ethylhexylacrylate.

USE - The emulsion is used as substit. of chloroprene adhesive harmful for pollution; useful for adhesion of plastic, fibre, metal or wood board.

ADVANTAGE - Control of pH 5-8 can give high setting ability in normal temp. and, storage stability.

CHOSEN-DRAWING: Dwg.0/0

TITLE-TERMS: AQUEOUS RESIN EMULSION PREPARATION EMULSION POLYMERISE POLYEPOXIDE
RESIN RADICAL POLYMERISE MONOMER CONTAIN ACRYLIC ACID METHACRYLIC
ACID WATER CONTAIN MEDIUM

DERWENT-CLASS: A14 A21 A81 G01

CPI-CODES: A04-F04A; A05-A01B; A07-A04A; A07-B02; A07-B04; A10-B03; G03-B02D1;
G03-B02E2;

ENHANCED-POLYMER-INDEXING:

Polymer Index [1.1]

018 ; G1570*R G1558 D01 D11 D10 D23 D22 D31 D42 D50 D69 D73 D83
F47 7A ; R00470 G1161 G1150 G1149 G1092 D01 D11 D10 D19 D18 D32

* NOTICES *

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- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.**** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the manufacturing method of the water resin dispersing element which demonstrates high thermal resistance, a water resisting property, and an adhesive property by making it dry with ordinary temperature or heating by giving adhesive strength detailed and high immediately after desiccation, and leaving it as it is in ordinary temperature about the manufacturing method of the aqueous resin dispersing element which gives the property which demonstrates adhesiveness and serves as non-adhesiveness in connection with the passage of time.

[0002]

[Description of the Prior Art] In recent years, development of an ingredient gentle to saving resources and earth environment is furthered. The alternative of solvent system chloroprene adhesives is positively performed also in it. Since it is after [(2) care of health] quantity crystallinity with the adhesive strength good [these chloroprene adhesives] immediately after (1) solvent desiccation (contact nature), (3) thermal resistance with high adhesive strength and a water resisting property have the good description of **. There is that [no] whose aqueous-ization of these chloroprene adhesives cannot aim at contact nature, adhesive strength after care of health, and thermal resistance and waterproof balance, but may still satisfy them although emulsion-izing of chloroprene rubber, high performance-ization of a certain thermoplastic acrylic emulsion from the former and an urethane emulsion, etc. are performed.

[0003] On the other hand, the attempt which is not thermoplastic emulsion independent [conventional] and aims at contact nature, adhesive strength after care of health, thermal resistance, and waterproof balance with combination with a thermosetting epoxy resin occurs.

[0004]

[Problem(s) to be Solved by the Invention] However, only by blending the emulsion of an epoxy resin simply, there was a fault that a lot of emulsifiers used when an epoxy resin and the remaining polymer components dissociate during storage or an epoxy resin emulsion is manufactured affected a water resisting property. As opposed to these, by JP,49-106586,A news, the emulsion polymerization was performed under epoxy resin existence, and the problem of separation is solved. Moreover, in JP,57-115418,A news, while improving compatibility with an acrylic polymer and preventing the separation under storage by making a part of end of an epoxy resin into an acryloyl radical, improvement in the engine performance is aimed at. Although the conventional technical problem had been considerably solved by these amelioration, in the presentation currently indicated with both advanced technology, during storage of an emulsion, the reaction of the epoxy group of an epoxy resin and the carboxyl group originating in the carboxylic acid in a polymer advanced, and the problem to which the adhesive strength after storage falls as a result was included.

[0005]

[Means for Solving the Problem] In order to solve said technical problem, it inquires per [of an epoxy resin and a radical polymerization nature monomer] emulsion polymerization, and it completes paying attention to Tg of the film of the aqueous resin dispersing element which repeated examination per pH

of the aqueous medium in that case, and was obtained especially. That is, Tg of the film obtained from the aqueous resin dispersing element characterized by this invention consisting of adjusting pH of an aqueous medium to 5-8, and carrying out the emulsion polymerization of the radical polymerization nature monomer 40 containing the (B) acrylic acid and/or a methacrylic acid - the 80 weight sections to the bottom of existence of the (A) epoxy resin 20 - 60 weight sections be the manufacturing method of the aqueous resin dispersing element which be 10--40 degree C.

[0006] This invention is explained below at a detail. the compound which has one or more epoxy groups in 1 molecule with the epoxy resin used by this invention -- it is -- for example, glycidylethers, glycidyl ester, glycidyl amines, and a line -- aliphatic series epoxide, alicyclic group epoxide, etc. are mentioned.

[0007] As glycidylethers, aromatic series glycidyl ether and aliphatic series glycidyl ether are mentioned, and the diglycidyl ether of a bisphenol, the poly glycidyl ether of a phenol novolak, and the diglycidyl ether of biphenol are mentioned as aromatic series glycidyl ether. As diglycidyl ether of this bisphenol For example, bisphenol A, Bisphenol F, bisphenol A D, Diglycidyl ether, such as Bisphenol S, tetramethyl bisphenol A, and tetrabromobisphenol A, is mentioned. As poly glycidyl ether of a phenol novolak For example, poly glycidyl ether, such as a phenol novolak, a cresol novolak, and a bromine-ized phenol novolak, is mentioned, and the diglycidyl ether of biphenol and tetramethyl biphenol is mentioned as diglycidyl ether of biphenol. As aliphatic series glycidyl ether, glycidyl ether, such as a polyethylene glycol, a polypropylene glycol, a glycerol, and tetramethylene glycol, is mentioned. As glycidyl ester, aromatic series glycidyl ester, alicyclic glycidyl ester, etc. are mentioned. As aromatic series glycidyl ester, diglycidyl ester, such as a phthalic acid, a terephthalic acid, and isophthalic acid, is mentioned, for example, and glycidyl ester, such as hexahydrophthalic acid, a tetrahydrophthalic acid, and dimer acid, is mentioned as alicyclic glycidyl ester.

[0008] As glycidyl amines, tetraglycidyl ether diamino diphenylmethane, tetraglycidyl metaxylylene diamine, triglycidyl amino fail, etc. are mentioned, for example. a line -- as aliphatic series epoxide, for example, epoxidation polybutadiene, epoxidized soybean oil, etc. are mentioned, and 3,4-epoxy-6-methylcyclohexylmethyl carboxylate, 3, and 4 epoxycyclohexylmethyl carboxylate etc. is mentioned as alicyclic group epoxide.

[0009] An epoxy resin may be used independently and may combine two or more kinds. From thermal resistance and a waterproof viewpoint, desirable epoxy resins are glycidylethers, are diglycidyl ether of a bisphenol still more preferably, and are diglycidyl ether of Biphenol A and Biphenol F especially preferably. The range thing of 100-10000 can be used, and from room-temperature-setting nature, thermal resistance, and a waterproof viewpoint, the weight per epoxy equivalent of an epoxy resin is 150-3000 preferably, and is 170-1000 still more preferably.

[0010] The combination of for example, a. aromatic series unsaturated compound, b.alpha, the alkyl ester of beta-partial saturation monocarboxylic acid, c. acrylic acid, a methacrylic acid, etc. can be mentioned as a radical polymerization nature monomer which contains an acrylic acid and/or a methacrylic acid by this invention. Styrene, alpha methyl styrene, vinyltoluene, etc. are mentioned as an aromatic series unsaturated compound. The alkyl ester of C1-C12 of an acrylic acid or a methacrylic acid is mentioned as alkyl ester of alpha and beta-partial saturation monocarboxylic acid. As alkyl ester of C1-C12 of an acrylic acid or a methacrylic acid, for example, methyl acrylate, Ethyl acrylate, propylacrylate, isopropyl acrylate, Butyl acrylate, isobutyl acrylate, hexyl acrylate, Cyclohexyl acrylate, 2-ethylhexyl acrylate, laurylacrylate, Methyl methacrylate, ethyl methacrylate, propyl methacrylate, Isopropyl acrylate, butyl methacrylate, isobutyl methacrylate, hexyl methacrylate, cyclohexyl methacrylate, 2-ethylhexyl methacrylate, lauryl methacrylate, etc. are mentioned.

[0011] It may be the combination of a. aromatic series unsaturated compound, b.alpha, the alkyl ester of beta-partial saturation monocarboxylic acid, c. acrylic acid, and/or a methacrylic acid preferably in a radical polymerization nature monomer, and a, b, and c may be used independently respectively, and each may be two or more sorts of mixture. Preferably, as an a. aromatic series unsaturated compound, it is styrene, is ethyl acrylate, butyl acrylate, and 2-ethylhexyl acrylate as alkyl ester of C1-C12 of b.alpha and beta-partial saturation monocarboxylic acid, is butyl acrylate still more preferably, and a methacrylic acid.